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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/099,721	03/14/2002	Gregory E. James	NVIDP074/P000427	1906
28875	7590	09/28/2005	EXAMINER	
Zilka-Kotab, PC P.O. BOX 721120 SAN JOSE, CA 95172-1120			ORTIZ RODRIGUEZ, CARLOS R	
			ART UNIT	PAPER NUMBER
			2125	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/099,721

Applicant(s)

JAMES, GREGORY E.

Examiner

Carlos Ortiz-Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/18/02</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1, 26 and 27 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the detailed descriptions applicant states inputting boundary conditions and utilizing relaxation operations, clearly indicating that the invention is different from the scope defined in the claim(s). It's unclear what applicant's intended metes and bounds of the claims are, since the claims appears to cover every type of inputting in the hardware graphics pipeline and every type of generating a solution utilizing the hardware graphics pipeline.

Additionally claims 1, 26 and 27, omits steps/element, such omission amounting to a gap between the steps/elements. The omitted steps/elements are: for performing the receiving, processing and generating. Applicant states receiving and processing an input but applicant fails to claims specific essential steps or elements that would clearly specify how the invention is receiving the input and how the invention is processing the input to generate a solution to the partial differential equation utilizing the hardware graphics pipeline. And more importantly the preamble provides for computing but the claim body does not teach how to compute a partial differential equation.

*Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-31 rejected under 35 U.S.C. 102(e) as being anticipated by Kaufman et al. U.S. Pub. No. 2004/0125103.

Regarding claims 1-31 Kaufman et al. discloses A method for computing partial differential equations in a hardware graphics pipeline, comprising: receiving boundary conditions (see for example Paragraph 0261 Lines 8-22 and Paragraphs 0264, 0312, 0362) in the form of at least one of geometry and textures (see for example Paragraph 0402); computing a solution to the partial differential equation utilizing a relaxation operation involving the boundary conditions, at least some the computing done in the hardware graphics pipeline (see for example Paragraphs 0515, 0516 and 0536); determining whether the solution has converged by: calculating errors, summing the errors, and concluding that the solution has converged if the sum of errors is less than a predetermined amount; if the solution has not converged, repeating the computing and determining; if the solution has converged, incrementing a time value; and repeating the foregoing operations using the incremented time value (see for example Paragraphs 0522 and 0535). Additionally, Kaufman et al. discloses rendering the 3D graphics image (see for example abstract and Paragraphs 0012, 0015, 0138), generated textures by sampling a texture map and utilizing a plurality of filters (see for example Paragraph 0182).

*Citation of Pertinent Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to system and method for calculating partial differential equations in a hardware graphics pipeline:

- a. U.S. Pat. No. 6,005,582 to Gabriel et al., which discloses method and system for texture mapping images with anisotropic filtering.
- b. U.S. Pat. No. 6,384,824 to Morgan et al., which discloses method, system and computer program product for multi-pass bump-mapping into an environment map.
- c. U.S. Pat. No. 6,593,925 to Hakura et al., which discloses parameterized animation compression methods and arrangement.
- d. U.S. Pat. No. 6,765,584 to Wloka et al., which discloses system and method for creating a vector map in a hardware graphics pipeline.
- e. U.S. Pat. No. 6,876,361 to Venkataraman, which discloses architecture for real-time texture look ups for volume rendering.
- f. U.S. Pat. No. 6,906,723 to Ault Jr., which discloses generating partials for perspective corrected texture coordinates in a four pixel texture pipeline.

The following publications are cited to further show the state of the art with respect to system and method for calculating partial differential equations in a hardware graphics pipeline:

- g. U.S. Pub. No. 2001/0028352 to Naegle et al., which discloses graphics system having a super-sampled sample buffer and having single sample per pixel support.
- h. U.S. Pub. No. 2002/0130865 to Venkataraman, which discloses architecture for real-time texture look ups for volume rendering.

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- i. U.S. Pub. No. 2002/0190996 to Ault, Jr., which discloses generating partials for perspective corrected texture coordinates in a four pixel texture pipeline.
- j. U.S. Pub. No. 2003/0001851 to Bushey, which discloses system and method for combining graphics formats in a digital video pipeline.
- k. Molnar et al., "PixelFlow: High-Speed Rendering Using Composition", ACM 1992
- l. Roy, Promit, "Direct3D vs. OpenGL: Which API to use When, Where, and Why", [www. GameDev.net](http://www.GameDev.net), 2/24/2002

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is (571) 272-3747. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The central official fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the general information number at 800-786-9199.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Carlos Ortiz-Rodriguez  
Patent Examiner  
Art Unit 2125

cror

September 24, 2005

 9-26-05  
ALBERT W. PALADINI  
PRIMARY EXAMINER